

The Effects of Three Plant Growth Substances on DPL 90

Wallace C. Hofmann, Crop Physiologist; Peter T. Else, Technician;
and Ramadjita Tabo, Graduate Research Associate

Summary

Plant growth substances from BioHumaNetics, Burst Agritech, and the Westbridge Research Group were evaluated under field conditions at Casa Grande. Various schedules and rates of application were assessed. No significant differences in either the growth of the plants or yield were detected.

* * * * *

Foliar fertilizers and plant growth regulators have proven to increase yields in some crops such as grapes and tree fruits. Foliar applications of essential plant nutrients have given inconsistent results in cotton. Plant growth regulators, such as PIX, have proven to be effective cotton management tools. To evaluate their effects on cotton yields, commercially available substances from BioHumaNetics, Burst Agritech and the Westbridge Research Group were applied to DeltaPine 90 grown in a field managed by Claude and Mike Evans in Casa Grande. Each compound was evaluated in separate randomized complete block experiments. The field was planted on 5 April with a spot planting on 27 April.

Each experimental plot was 6 rows wide by 1240 feet. With the exception of the treatments, standard cultural practices were conducted. All foliar experimental materials were applied with a modified "high boy" type sprayer at various rates and frequencies over the growing season (Tables 1, 2, 3). Irrigations were made at approximately two week intervals on 14 May, 12 June, 30 June, 17 July, 29 July, 15 August, and 7 September. The field did not dry out sufficiently between 17 July and 15 August for the high boy to enter the field. Therefore, the last foliar treatments had to be applied with a hand-held boom to 7 foot subplots which were hand harvested.

Visual evaluations of the plants were made at early flowering (29 June), mid-bloom (24 July), and at the end of the flowering period (5 September). Any indications of chlorosis and necrosis were noted. Also recorded were the number of flowers, bolls, and open bolls.

The entire field was defoliated on 8 October. The hand sprayed plots were picked between 9 and 11 October. A second hand harvest occurred on 16 October. The center four rows of each experimental plot were spindle picked on 17 and 18 October.

Results

The visual evaluations conducted over the growing season showed no differences between any of the treatments within the 3 experiments. There were no significant differences or consistent trends in the flowering and fruiting patterns.

There were no significant differences detected in yields for any of the treatments (Table 4). There was a trend observed in the BioHumaNetics test,

where the intermediate treatment (Tmt 3) had slightly higher yields from both the total hand pick and machine harvest.

When interpreting these results, it should be noted that the 1984 growing season was extremely favorable. It may not have been a good season to evaluate a material designed to enhance the performance of a stressed plant.

Table 1. Treatment Schedule for the BioHumaneNetics Evaluations.

<u>Date</u>	<u>Materials Applied (with targeted rate)</u>	<u>Treatment Plot</u>
5/15-5/16	Soil application Huma P ¹ at 1.9 pts/a Huma Mix ² at 2.4 pts/a	Tmt 2 & 3 Tmt 2 & 3
6/7	Soil application (machine sprayed): Huma P at 1.9 pts/a Huma Mix at 2.4 pts/a	Tmt 2 Tmt 2
6/26	Foliar application (machine sprayed): PEK ³ at 1 pt/a HumaTol ⁴ at 2 pts/a	Tmt 2 & 3 Tmt 2 & 3
6/27	Soil application (machine sprayed): Huma P at 1.9 pts/a HumaLase ⁵ at 2.4 pts/a	Tmt 2 & 3 Tmt 2 & 3
7/12	Foliar application (machine sprayed): PEK at 1 pt/a HumaTol at 2 pts/a	Tmt 2 Tmt 2
7/12	Soil application (machine sprayed): Huma P at 1.9 pts/a HumaLase at 2.4 pts/a	Tmt 2 Tmt 2
8/9	Foliar application (hand sprayed on subplots) Micro Humus ⁶ at 6 pts/a	Tmt 2 & 3
8/9	Soil application (hand sprayed on subplots) PEK at 8 pts/a	Tmt 2 & 3

1/ Huma-P: available phosphoric acid (P₂O₅), 30%, Humic Acid, 20%.

2/ Huma Mix: This mix contained phosphoric acid, soluble potash, available calcium and magnesium, and HumaLase (see footnote 5).

3/ PEK: 20-0-0, urea as nitrogen source

4/ HumaTol: 8-16-5, with Urea, P₂O₅, and potassium carbonate as sources. Also contains S (1%), Fe (1%), Mn (0.5%), Zn (0.5%), and humic acid (20%).

5/ HumaLase: 20-0-0, with calcium nitrate as nitrogen source. Also contains cellulase, alpha amylase, humic acid, and several microorganism cultures.

6/ Micro Humus: iron (0.1%), Mn (0.05%), Zn (0.05%), humic acid (20%).

Table 2. Treatments applied in the Burst Agritech Evaluations.

Treatment	Description
1	Control
2	Burst ¹ at 1/2 pt/a at 1st elongated square ²
3	Burst at 1/2 pt/a at mid bloom ³
4	Burst at 1/2 pt/a at 2nd bloom ⁴
5	Treatment 2 + Treatment 3
6	Treatment 2 + Treatment 3 + Treatment 4

1/ Burst "Yield Booster": Cytokinin as Kinetin (.004%) based on biological activity.

2/ Actual application date was 6/26; materials were machine-applied.

3/ Actual application date was 7/12; materials were machine-applied.

4/ Actual application date was 8/9; materials were hand-sprayed in subplots designated for hand-harvest.

Table 3. Treatments applied in the Westbridge Research Group Evaluations.

Treatment	Description
1	H4-301 ¹ at 9 oz/a at pinhead square ²
2	H4-301 at 3 oz/a at pinhead square H4-301 at 3 oz/a at first bloom ³ H4-301 at 3 oz/a at mid-bloom ⁴
3	Treatment 1 with 594 ml/a of humic acid
4	Treatment 2 with 594 ml/a of humic acid with each application
5	Control

1/ Composition not known to author.

2/ Actual application date was 6/26; materials were machine-applied.

3/ Actual application date was 7/12; materials were machine applied.

4/ Actual application date was 8/9; materials were hand-sprayed on subplots designated for hand-harvest.

Table 4. Seed cotton yields from experiments evaluating BioHumaNetics, Burst, and Westbridge H4-301 plant growth substances.

		- - - - Seed Cotton (lbs/a) - - - -			
<u>Experiment</u>	<u>Treatment</u>	<u>1st Hand Pick</u>	<u>2nd Hand Pick</u>	<u>Total Hand Pick</u>	<u>Machine Harvest</u>
BioHumaNetics	1 (control)	4474	100	4574	4216
	2	4266	152	4418	4330
	3	4961	147	5108	4343
Burst Agritech	1 (control)	4818	186	5004	4148
	2	4321	69	4390	4127
	3	4981	108	5089	3954
	4	5183	193	5376	NA
	5	4495	111	4606	4148
	6	4616	118	4734	NA
Westbridge Research	1	4446	41	4487	4065
	2	3990	39	4029	NA
	3	4151	41	4192	3871
	4	4252	42	4281	NA
	5 (control)	4734	99	4833	4210